I claim:

1. An improved preservation solution for organs and tissues or parts thereof from humans and animals, comprising:

calcium,

at least one colloidosmotically active substance, and

optionally nitroglycerin.

2. The improved preservation solution according to claim 1, wherein said nitroglycerin is present in an amount of about 10^{-4} - 10^{-7} M, and said calcium is present in an amount of about 0.3-1.5 mM calcium, based on the final volume of the improved preservation solution.

3. The improved preservation solution according to claim 2, wherein said amount of calcium is about 1.1 mM, and said amount of nitroglycerin is about 10^{-5} - 10^{-6} M, based on the final volume of the improved preservation solution.

4. The improved preservation solution according to claim 1, further comprising at least one member selected from the group consisting of about 1-12 IE/ml heparin and about 120 mg/l penicillin as antibiotic, based on the final volume of the improved preservation solution.

5. The improved preservation solution according to claim 1, wherein said solution further comprises about 1-15% by weight low-molecular dextran having an average molecular weight of about 1,000 daltons, about 3-8% by weight high-molecular dextran having an average

molecular weight of 40,000 - 120,000 daltons as said colloidosmotically active substance, about 0.1 - 2.6% glucose as a substrate, buffer, about 4-25 mM potassium ions, about 1-16 mM magnesium ions, about 50-150 mM sodium ions and about 50-150 mM chloride ions, based on the final volume of the improved preservation solution.

6. The improved preservation solution according to claim 1, wherein said solution comprises 50 g/l dextran 40 having a molecular weight of about 40,000 daltons as said colloidosmotically active substance, 5 mM glucose as substrate, 0.8 mM phosphate buffer, 6 mM potassium ions, 0.8 mM magnesium ions, 138 mM sodium ions, 142 mM chlorine ions and 0.8 mM sulphate ions, and 0.24 ml THAM buffer, based on the final volume of the improved preservation solution.

7. The improved preservation solution according to claim 5, wherein the concentration of potassium ions is about 16-25 mM, and the concentration of magnesium ions is about 12-16 mM, based on the final volume of the improved preservation solution.

8. The improved preservation solution according to claim 4, wherein a pH of said solution is about 7.4-7.6.

9. The improved preservation solution according to claim 1, wherein said heparin is a low-molecular heparin.

10. A method for preserving organs and tissues or parts thereof from humans and animals, comprising:

flushing an organ or a tissue with, and immersing in, the improved preservation solution according to claim 1, and

storing said solution containing said organ or tissue at a temperature of 0.5-12°C, preferably 2-8°C, for at most 36 hours for long-term preservation, or at a temperature of about 4-24°C for at most 2 hours for short-term preservation.

11. The improved preservation solution according to claim 1, wherein said colloidosmotically active substance comprises a high-molecular weight dextran, albumin, or hydroxy ethyl starch.

12. The improved preservation solution according to claim 11, wherein said high-molecular weight dextran substance is at least one member selected from the group consisting of dextran 40, 60, 70 or 120.

13. The improved preservation solution according to claim 1, wherein said substrate is at least one member selected from the group consisting of glucose, fructose, galactose, pyruvic acid, fatty acids, triglycerides, amino acids, and alcohols.

14. The improved preservation solution according to claim 4, wherein said antibiotic is benzyl penicillin.

15. The improved preservation solution according to claim 9, wherein said low-molecular weight heparin is fragmin.

16. The method of preserving organs and tissues or parts thereof from humans or animals according to claim 10, wherein said tissue comprises blood vessels or parts thereof.

17. The method of preserving organs and tissues or parts thereof from humans or animals according to claim 10, wherein said tissue is vena sapena magna or parts thereof.

18. The method of preserving organs and tissues or parts thereof from humans or animals according to claim 10, wherein said organs and tissues comprise lungs.

19. A method of preserving endothelium-dependent relaxation factor function in organs, tissues and parts thereof, comprising storing said organs, tissues and parts thereof in the improved preservation solution according to claim 1.

20. A method of preserving contractile function in contractile tissue, comprising storing the contractile tissue in the improved preservation solution according to claim 1.

21. A method of preserving contractile function in contractile tissue, comprising storing the contractile tissue in a preservation solution comprising:

nitroglycerin present in an amount of about 10^{-4} - 10^{-7} M; and

calcium ions present in an amount of about 0.3 - 1.5 mM calcium, based on the final volume of preservation solution.

22. A method for maintaining the integrity of vascular endothelium, comprising:

exposing said organs, tissues and parts thereof to the preservation solution according to claim 1.

23. A method for maintaining the integrity of vascular endothelium, comprising storing the contractile tissue in a preservation solution comprising,

nitroglycerin present in an amount of about 10^{-4} - 10^{-7} M; and

calcium ions present in an amount of about 0.3 - 1.5 mM calcium, based on the final volume of preservation solution.